

## SECTION 08114

### STEEL DOORS AND FRAMES

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#### **LANL MASTER CONSTRUCTION SPECIFICATION**

When editing to suit project, author shall add job-specific requirements and delete only those portions that in no way apply to the activity (e.g., a component that does not apply). To seek a variance from applicable requirements, contact the Engineering Standards Manual (ESM) Architectural POC.

When assembling a specification package, include applicable specifications from all Divisions, especially Division 1, General Requirements.

Delete information within "stars" during editing.

Specification developed for ML-3 / ML-4 projects. For ML-1 / ML-2, additional requirements and QA reviews are required.

This specification meets EPA's CPG Green Requirements.

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#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Steel doors and frames
- B. Fixed window frames.
- C. Steel sidelights and borrowed lights.
- D. [Louvers]

##### 1.2 REFERENCES

- A. ANSI A 250.6 – Hardware on Standard Steel Doors (Reinforcement – Application).
- B. ANSI A 250.8 – Recommended Specifications for Standard Steel Doors and Frames; Steel Door Institute (SDI).
- C. ANSI A 250.10 – Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for steel Doors and Frames.
- D. ANSI A 250.11 – Recommended Erection Instructions for Steel Frames
- E. SDI 111 – Recommended Standard Details for Steel Doors and Frames
- F. SDI 122 – Installation and Troubleshooting Guide for Standard Steel Doors and Frames.
- G. Door and Hardware Institute (DHI) 115.1G – Installation Guide for Doors and Hardware.
- H. ASTM A 366/A 366M – Standard Specification for Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality.
- I. ASTM A 568/A 568M – Standard Specification for Steel, Sheet, Carbon, and High-Strength, Low Alloy, Hot-Rolled and Cold-Rolled, General Requirements For.

- J. ASTM A 569/A 569M – Standard Specification for Steel, Carbon (0.15 Maximum, Percent), Hot-Rolled Sheet and Strip Commercial Quality.
- K. ASTM A 620/A 620M – Standard Specification for Drawing Steel (DS), Sheet, Carbon, Cold-Rolled.
- L. ASTM A 653/A 653M – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- M. ASTM A 924/A 924M – Standard Specification for General Requirements for Sheet Steel, Metallic-Coated by the Hot-Dip Process.
- N. NFPA 80 – Standard for Fire Doors and Windows.

### 1.3 SUBMITTALS

- A. Submit the following in accordance with the requirements of Section 01330, Submittals:
  - 1. Catalog data substantiating that product comply with specified requirements.
  - 2. Certifications for door assemblies required to be fire-rated that exceed sizes of tested assemblies, and for each door and frame assembly that has been constructed to conform to design, materials, and construction equivalent to the requirements for labeled construction.
  - 3. Shop drawings for fabrication and installation of steel doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of finish hardware and reinforcements, and details of joints and connections.
    - a. Show anchorage and accessory items.
    - b. Provide schedule of doors and frames using same reference numbers for details and openings as those on the Drawings.
    - c. Indicate coordination of glazing frames and stops with glass and glazing requirements.

### 1.4 QUALITY ASSURANCE

- A. Provide doors and frames complying with Steel Door Institute "Recommended Specifications: Standard Steel Doors and Frames" (SDI-100) and as herein specified.
- B. Fire-Rated Door Assemblies: Where fire-rated door assemblies are indicated or required, provide fire-rated door and frame assemblies that comply with NFPA 80 "Standard for Fire Doors and Windows", and have been tested, listed, and labeled in accordance with ASTM E 152 "Standard Methods of Fire Tests of Door Assemblies" by a nationally recognized independent testing and inspection agency acceptable to LANL.

### 1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver hollow metal work cartoned or crated to provide protection from damage during transit and job storage. In addition, provide sealed doors in plastic wrapping.
- B. Inspect hollow metal work upon delivery for damage. Minor damages may be repaired provided finish items are equal in all respects to new work and acceptable to Contract Administrator; otherwise, remove and replace.

- C. Store doors and frames at building site under cover. Store vertically, place units on minimum 4in. high wood blocking. Do not use non-vented plastic or canvas shelters which could create a humidity chamber. If cardboard wrapper on door becomes wet, remove carton immediately. Provide 1/4 inch space between stacked doors to promote air circulation.

## PART 2 PRODUCTS

### 2.1 PRODUCT OPTIONS AND SUBSTITUTIONS

- A. Alternate products may be accepted; follow Section 01630, Product Options and Substitutions.

### 2.2 MATERIALS

- A. Hot-Rolled Steel Sheets and Strip: Commercial quality carbon steel, pickled and oiled, complying with ASTM A 568 and ASTM A 1011.
- B. Cold-Rolled Steel Sheets: Commercial quality carbon steel, complying with ASTM A 568 and ASTM A 1008.
- C. Hot dipped zinc coated steel: ASTM A 924 and A 653, Class A40 for alloyed coatings.
- D. Supports and Anchors: Fabricate of not less than 18 gage galvanized sheet steel.
- E. Inserts, Bolts and Fasteners: Use manufacturer's standard units, except hot-dip galvanize items that are to be built into exterior walls, complying with ASTM A 153, Class C or D as applicable.
- F. Shop-Applied Paint Primer: Rust-inhibitive enamel or paint, either air-drying or baking, suitable as a base for specified finish paints.

### 2.3 FABRICATION, GENERAL

- A. Comply with ANSI A250.8.
- B. Fire-rated openings: Comply with NFPA 80.
  - 1. Affix permanent labels attesting to fire resistance.
  - 2. At stairway enclosures, provide units listed for 450 degree F maximum temperature rise rating for 30 minutes of exposure.
  - 3. Provide manufacturer's certificate that oversized openings have been constructed in accordance with all other applicable requirements for labeled door construction.

- C. Fabricate steel door and frame units to be rigid, neat in appearance and free from defects, warp or buckle. Wherever practicable, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory- assembled before shipment, to assure proper assembly at project site. Comply with requirements as follows:
1. Exterior Doors: SDI-100, Grade III, extra heavy-duty, Model 2, minimum 16-gage faces, insulated.
  2. Interior Door: SDI-100, Grade II, heavy-duty, Model 2, minimum 18 gauge faces, fire rated.
- D. Fabricate exposed faces of doors and panels from cold-rolled steel only.
- E. Fabricate frames, concealed stiffeners, reinforcement, edge channels, louvers and moldings from either cold-rolled or hot-rolled steel (at fabricator's option).
- F. Fabricate exterior doors, panels and frames from galvanized sheet steel. Close top and bottom edges of exterior doors as integral part of door construction or by addition of minimum 16 gage inverted steel channels.
- G. Unless otherwise indicated, provide countersunk flat Phillips heads for exposed screws and bolts.
- H. Prepare doors and frames to receive mortised and concealed finish hardware in accordance with the approved Finish Hardware Schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI A115 series specifications for door and frame preparation for hardware.
- I. Reinforce hollow metal doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied finish hardware may be done at project site.
- J. Locate finish hardware as shown on final shop drawings or, if not indicated, in accordance with "Recommended Locations for Builder's Hardware", published by Door and Hardware Institute.
- [I. Install stationary louvers for exterior doors as indicated.]
- J. Provide metal frames with concealed fastenings, unless otherwise indicated. Fabricate frames of minimum 16 gage cold-rolled furniture steel. Fabricate frames with mitered and welded corners.
- K. Door Silencers: Except on weatherstripped frames, drill stops to receive 3 silencers on strike jambs of single door frames and 2 silencers on heads of frames with pairs of doors.
- L. Provide face welded type frames unless otherwise indicated.

## 2.4 FINISHES

- A. Prime: Thoroughly clean doors and frames and chemically treat to ensure maximum paint adhesion, Factory apply coat of rust inhibiting primer, either air-dried or baked-on, to door and frame surfaces exposed to view.
- B. Finish: Meet acceptance requirements stated in ANSI A 250.10.

## 2.5 DESIGN CLEARANCES

- A. Unless noted otherwise, clearances are subject to tolerance of plus or minus 1/32 inch.
- B. Clearance between Door and Frame Head and Jambs: 1/8 inch.
- C. Clearance between Meeting Edges of Pairs of Fire-Rated Doors: 1/8 inch plus or minus 1/16 inch.
- D. Clearance between Meeting Edges of Non-Rated Pairs of Doors: 1/8 inch to 1/4 inch.
- E. Clearance at Bottom: 5/8 inch.
- F. Clearance between Door Face and Door Stop: 1/16 inch to 1/8 inch.

## PART 3 EXECUTION

### 3.1 Examination

- A. Verify that project conditions are suitable before beginning installation of frames.
  - 1. Verify that completed openings are of correct size and thickness.
- B. Correct unsatisfactory condition before proceeding with installation.

### 3.2 INSTALLATION

- A. Install frames plumb, level, rigid, and in true alignment as recommended in ANSI A250.11 and DHI A115.1G.
- B. General: Install standard steel doors, frames, and accessories in accordance with final shop drawings and manufacturer's data, and as herein specified.
- C. Placing Frames: Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders leaving surfaces smooth and undamaged.
  - 1. Install fire-rated frames in accordance with NFPA Std. No. 80.
  - 2. Steel Stud Partitions: Install at least three wall anchors per jamb at hinge and strike levels. In open steel stud partitions, place studs in wall anchor notches and wire tie. In closed steel stud partitions, attach wall anchors to studs with tapping screws. Solidly pack mineral-fiber insulation behind frame.
  - 3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.
  - 4. Concrete Walls: Solidly fill space between frames and concrete with grout. Install grout in lifts and take precautions, including bracing frames, to ensure that frames are not deformed or damaged by grout forces.
  - 5. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.

6. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor and secure with postinstalled expansion anchors.
  - a. Floor anchors may be set with powder-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
7. Installation Tolerances: Adjust Standard Steel door frames for squareness, alignment, twist, and plumb to the following tolerances:
  - a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
  - b. Alignment: Plus or minus 1/16 inch, measure at jambs on a horizontal line parallel to plane of wall.
  - c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
  - d. Plumbness: Plus or minus 1/16 inch, measured at

D. Door Installation:

1. Fit hollow metal doors accurately in frames, within clearances specified in SDI-100.
2. Place fire-rated doors with clearances as specified in NFPA Standard No. 80.

3.3 ADJUST AND CLEAN

- A. Prime Coat Touch-up: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.
- B. Final Adjustments: Adjust doors for proper operation, free from binding or other defects.
- C. Clean and restore soiled surfaces. Remove scraps and debris, and leave site in clean conditions.

END OF SECTION

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Do not delete the following reference information:

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FOR LANL USE ONLY

This project specification is based on LANL Master Construction Specification Rev 2, dated February 27, 2004.